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EXAMINER	
WANG, JIN CHENG	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/823,935	PETERSON ET AL.	
	Examiner	Art Unit	
	Jin-Cheng Wang	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,14,20,21,23,25-32 and 42-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,14,20,21,23,25-32 and 42-48* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/10/2008 has been entered. Claims 1, 14, 23, 27 and 42 have been amended. Claims 7-13, 15-19, 22, 24, 33-41, 49-97 have been canceled. Claims 1-6, 14, 20-21, 23, 25-32, 42-48 are pending in the application.

Response to Arguments

Applicant's arguments, filed April 10, 2008 have been considered, but are moot in view of the new ground(s) of rejection set forth below.

With respect to the claim 1, Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Leather et al. U.S. Pat. No. 6,999,100 (hereinafter Leather).

As addressed below, Leather teaches in Fig. 9 a method for calculating values for pixels of an image, comprising:

Calculating less than three sample values (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled*

samples to determine the final color for the pixel) for pixels of an image in accordance with a sampling pattern for each pixel, the sampling pattern for consecutive pixels alternating between a first and a second sampling pattern, wherein the calculation includes calculating a pair of sample values for pixels of an image in accordance with a sampling pattern for each pixel (*Leather teaches sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image; see Fig. 9*); each sampling pattern defining one or more sampling locations at which sample values are calculated and the second sampling pattern corresponds to the first sampling pattern rotated 90 degrees (See Fig. 9), the sampling locations being relative to a pixel (*e.g., Leather Fig. 9*);

Determining a value for at least one pixel by combining sample values calculated for the sampling locations for the pixel (*e.g., Leather Fig. 9*); and

Producing the value for the at least one pixel to be saved as graphics data for the image (column 6, lines 15-67).

With respect to the claims 23 and 27, Claims 23 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Deering U.S. Pat. No. 6,664,955 (hereinafter Deering).

As addressed below, Deering teaches a method for calculating values for pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating sample values for pixels of the image in accordance with a plurality of sampling rates, the sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate differing for at least two pixels of the image (*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels*) and alternating per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image (*Deering discloses in Fig. 5A alternating per pixel for consecutive pixels along the horizontal lines dividing the pixels wherein the horizontal lines are parallel to horizontal axis of the image; see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*);

Calculating values for pixels of the image from respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Storing the values for the pixels as graphics data for the image (Fig. 7).

With respect to the 112 rejection to the claim 42 and similar claims, applicant argues in essence that the embodiments in Fig. 5a or 5b without even mentioning the embodiments of Fig. 8 or Fig. 9. Applicant cited Fig. 5a to support the claimed four candidate locations by giving the locations (0, 1), (1, 3), (3, 0), and (4, 2) for a pixel. However, applicant ignored the claim 42 also recites "the four candidate sample locations for a given sampling pattern" wherein each given sampling pattern per pixel is required. Applicant added any two arbitrary locations (0, 1)

and (4,2) to the existing two candidate sample locations (1, 3) and (3,0) indicated in Fig. 5a for the first sampling pattern of the first pixel and (0,1) and (4,2) is set forth for the second sampling pattern of the second pixel. Applicant speculated that there are four candidate locations per sampling pattern or per pixel. The term "four candidate sampling locations", for its own sake, has its own very meaning of candidacy for selection per pixel in the context of the claim invention set forth in the claim 42. However, Fig. 5a failed to identify four candidate locations per sampling pattern or per pixel. There are a total of 16 sampling locations in Fig. 5a per sampling pattern or per pixel.

In Fig. 5a, only the two sample locations (1, 3) and (3, 0) are marked as the two candidate sampling locations for the first sampling pattern of the first pixel. The sampling location (0, 1) and (4, 2) are not marked for the first sampling pattern of the first pixel in Fig. 5a and do not constitute the claimed candidate sample locations. The locations (0, 1) and (4,2) do not constitute the claimed candidate sampling locations wherein the samples are selected in a way defined by the claim invention.

On the other hand, the examiner respectfully disagrees with the applicant's argument. Different embodiments cannot be combined. Fig. 8 or Fig. 9 discloses an image having sampling patterns for pixels defined by four sampling locations. Fig. 5a or 5b discloses a different image having sampling patterns for pixels defined by two sampling locations. Applicant's claim 42 recites "calculating values for pixels of an image" wherein the image refers to the image in Fig. 5a. It cannot refer to both the image in Fig. 5a and a different image in Fig. 9. The image in Fig. 5a is different from the image in Fig. 9. Applicant's claim 42 further recites "the sampling pattern having only two sample locations relative to a pixel". The pixel cannot refer to both the

pixel in Fig. 5a and a different pixel in Fig. 9. The pixel in Fig. 5a is different from the pixel in Fig. 9.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6, 14, 20-21, 23, 25-32, and 42-48 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-6, 14, 20-21, 23, 25-32, 42-48:

Claim 1 recites a computer program or control signals as evidenced in lines 4-6 of Page 10 in the applicant's specification wherein it stated "embodiments of the present invention include…**control signals** and the like necessary to perform operations on each component for multi-component sample values", as evidenced in line 8 and line 20 of Page 18 wherein it stated "embodiments of the present invention permit **re-programming**…**control signals and software** operations" and as evidenced in lines 12-13 of Page 18 wherein it stated "embodiments of the present invention may be practiced using conventional **software language**."

However, software or a computer program or control signals per se are neither computer components nor statutory process. Thus, claim 1 is non-statutory.

Since claim 1 includes a 101 judicial exception, claim 1 must be for a practical application of the judicial exception. As is, claim 1 failed to recite either a physical

transformation or produces a useful and tangible result. Thus, claim 1 is also non-statutory for this reason.

Applicant merely claims steps of calculating less than three sample values....determining a value…producing the value for the at least one pixel to be saved as graphics data for the image..... Said steps (which include instruction as further evident in applicant's specification at Pages 10 and 18) are merely descriptive material without reaching a final result as being useful, concert and tangible.

As per 35 USC 101 guidelines nonfunctional descriptive material may be claimed in combination with other functional descriptive multi- media material on a computer readable medium to provide the necessary functional and structural interrelationship to satisfy the requirements of 35 USC 101.

Claims 2-6, 14, 20-21, 23, 25--32 and 42-48 are non-statutory for the same reasons discussed above.

Computer-Related Nonstatutory Subject Matter

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive

material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.

Both types of "descriptive material" are nonstatutory when claimed as descriptive material per se. Warmerdam, 33 F.3d at 1360, 31 USPQ2d at 1759. See Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).

When nonfunctional descriptive material is recorded on some computer-readable medium, in a computer or on an electromagnetic carrier signal, it is not statutory since no requisite functionality is present to satisfy the practical application requirement. Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored in a computer-readable medium, in a computer, on an electromagnetic carrier signal does not make it statutory. See Diehr, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in Benson were unpatentable as abstract ideas because "[t]he sole practical application of the algorithm was in connection with the programming of a general purpose computer."). Such a result would exalt form over substance. In re Sarkar, 588 F.2d 1330, 1333, 200 USPQ 132, 137 (CCPA 1978) ("[E]ach invention must be evaluated as claimed; yet semantogenic considerations preclude a determination based solely on words appearing in the claims. In the final analysis under § 101, the claimed invention, as a whole, must be evaluated for what it is.") (quoted with approval in Abele, 684 F.2d at 907, 214 USPQ at 687). See also In re Johnson, 589 F.2d 1070, 1077, 200 USPQ 199, 206 (CCPA 1978) ("form of the claim is often an exercise in drafting"). Thus, nonstatutory music is not a computer component and it does not become statutory by merely recording it on a compact disk. Protection for this type of work is provided under the copyright law.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim42-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

For example, the base claim 42 recites, "a pixel considered as divided evenly into **a four-by-four array** of sub-regions, the sampling pattern having only two sample locations relative to a pixel, each sample location located at one of four candidate sampling locations."

However, applicant's specification does not disclose selecting two sample locations from **four candidate sampling locations, with respect to the same image or a sampling pattern of a pixel in the same image**. See Figs. 5a or 5b wherein only two sample locations are selected from two candidate sampling locations, among a total of 16 sampling locations. There is no *indication* of four candidate sampling locations. The sampling pattern is relative to a pixel in the same Figure or the same embodiment and cannot be both relative to a pixel in Fig. 5a and another pixel in Fig. 9. The pixel in Fig. 5a is different from the pixel in Fig. 9. Different embodiments cannot be combined to construe the claim invention.

With respect to the 112 rejection to the claim 42 and similar claims, applicant argues in essence that the embodiments in Fig. 5a or 5b without even mentioning the embodiments of Fig. 8 or Fig. 9. Applicant cited Fig. 5a to support the claimed four candidate locations by giving the

locations (0, 1), (1, 3), (3, 0), and (4, 2) for a pixel. However, applicant ignored the claim 42 also recites "the four candidate sample locations for a given sampling pattern" wherein each given sampling pattern per pixel is required. Applicant added any two arbitrary locations (0, 1) and (4,2) to the existing two candidate sample locations (1, 3) and (3,0) indicated in Fig. 5a for the first sampling pattern of the first pixel and (0,1) and (4,2) is set forth for the second sampling pattern of the second pixel. Applicant speculated that there are four candidate locations per sampling pattern or per pixel. The term "four candidate sampling locations", for its own sake, has its own very meaning of candidacy for selection per pixel in the context of the claim invention set forth in the claim 42. However, Fig. 5a failed to identify four candidate locations per sampling pattern or per pixel. There are a total of 16 sampling locations in Fig. 5a per sampling pattern or per pixel.

In Fig. 5a, only the two sample locations (1, 3) and (3, 0) are marked as the two candidate sampling locations for the first sampling pattern of the first pixel. The sampling location (0, 1) and (4, 2) are not marked for the first sampling pattern of the first pixel in Fig. 5a and do not constitute the claimed candidate sample locations. The locations (0, 1) and (4,2) do not constitute the claimed candidate sampling locations wherein the samples are selected in a way defined by the claim invention.

See also Figs. 8-9 wherein four sample locations are selected from the four candidate locations or four sample locations are selected from the 4 by 4 subpixels for each pixel. There is no indication of *less than three sample locations*. Figs 5a and 5b represent different embodiments of sampling pattern than those of Figs. 8-9 and cannot possibly be combined.

Fig. 8 or Fig. 9 discloses an image having sampling patterns for pixels defined by four sampling locations. Fig. 5a or 5b discloses a different image having sampling patterns for pixels defined by two sampling locations. Applicant's claim 42 recites "calculating values for pixels of an image" wherein the image refers to the image in Fig. 5a. It cannot refer to both the image in Fig. 5a and a different image in Fig. 9. The image in Fig. 5a is different from the image in Fig. 9. Applicant's claim 42 further recites "the sampling pattern having only two sample locations relative to a pixel". The pixel cannot refer to both the pixel in Fig. 5a and a different pixel in Fig. 9. The pixel in Fig. 5a is different from the pixel in Fig. 9.

The claims 43-48 depend upon the claim 42 and are rejected due to their dependency on the claim 42.

However, **applicant's specification does not describe a combination of these limitations in a single embodiment**. Therefore, these claim limitations set forth in the claim 88 are not described in the specification in such a way that as to reasonably convey to one of the ordinary skill in art had possession of the claimed invention.

Due to the 112 rejection to the claims set forth in above, the prior art rejection of the claims 42-48 are based on the claim limitations best understood by the Examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 23, 25-32, 42-48 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation "the sampling rate" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim. The claims 25-32 depend upon the claim 23 and are rejected due to their dependency on the claim 23.

Claim 42 recites the limitation "the four candidate sample locations" in lines 8-9 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Additionally, the claim 42 fails to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim 42 recites “the sampling pattern having only two sample locations relative to a pixel” which is contradictory with “the region of potential sampling locations relative to a pixel considered as divided evenly into a four-by-four array of sub-regions”. The claims 43-48 depend upon the claim 42 and are rejected due to their dependency on the claim 42.

Due to the 112 rejection to the claims set forth in above, the prior art rejection of the claims 42-48 are based on the claim limitations best understood by the Examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1, 14, 20 and 42-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Leather et al. U.S. Pat. No. 6,999,100 (hereinafter Leather).

Claim 1:

Leather teaches in Fig. 9 a method for calculating values for pixels of an image, comprising:

Calculating less than three sample values (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*) for pixels of an image in accordance with a sampling pattern for each pixel, the sampling pattern for consecutive pixels alternating between a first and a second sampling pattern, wherein the calculation includes calculating a pair of sample values for pixels of an image in accordance with a sampling pattern for each pixel (*Leather teaches sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image; see Fig. 9*); each sampling pattern defining one or more sampling locations at which sample values are calculated and the second

sampling pattern corresponds to the first sampling pattern rotated 90 degrees (See Fig. 9), the sampling locations being relative to a pixel (*e.g., Leather Fig. 9*);

Determining a value for at least one pixel by combining sample values calculated for the sampling locations for the pixel (*e.g., Leather Fig. 9*); and

Producing the value for the at least one pixel to be saved as graphics data for the image (column 6, lines 15-67).

Claim 14:

Leather teaches a method for generating an image having pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating two sample values per pixel of the image (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*) in accordance with a plurality of sampling patterns (Fig. 9), one sampling pattern per pixel, one pair of sampling points per sampling pattern (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final*

color for the pixel), a first sampling pattern defines sample positions relative to a given pixel on opposite sides of a line parallel to a first axis of the image and dividing the respective pixel in two, and a second sampling pattern defines sample positions relative to a given pixel on opposite sides of a line parallel to a second axis of the image and dividing the respective pixels in two (*Leather teaches sampling patterns for adjacent pixels wherein the sampling patterns alternate between two different patterns for a plurality of pixels in an image and calculating two sample values for pixels of an image; see Fig. 9*), the second sampling pattern substantially corresponding to the first sampling pattern rotated 90 degrees (See Fig. 9);

Calculating a value for at least one pixel of the image from a respective pair or pairs of calculated sample values (*Leather teaches in column 7, lines 19-25 calculating two enabled samples for the sampling pattern of Fig. 9 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel*); and

Storing the calculated value for the at least one pixel for use as graphics data for the image (column 6, lines 15-67).

Claim 20:

The claim 20 encompasses the same scope of invention as that of claim 14 except additional claimed limitation that all sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four array of sub-regions and four potential sample

positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions, the plurality of sampling patterns comprising first and second sampling patterns, each defining two sampling positions from the four potential sampling positions, the first sampling pattern having sample locations in the first and fourth rows of the array and the second sampling pattern having sample locations in the second and third rows of the array.

However, Leather further discloses the claimed limitation that all sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four array of sub-regions and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions, the plurality of sampling patterns comprising first and second sampling patterns, each defining two sampling positions from the four potential sampling positions, the first sampling pattern having sample locations in the first and fourth rows of the array and the second sampling pattern having sample locations in the second and third rows of the array (*See Leather Fig. 9, wherein the sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four arrays of sub-regions---each region having a 3*3 sub-pixels, and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions , the plurality of sampling patterns comprising first and second sampling patterns with the second sampling pattern rotated 90 degree, each defining two enabled sampling positions from the three sampling positions or the four potential sampling positions in the array because there exists at least four potential sampling positions that can be generated; see also column 7*).

Claim 42:

Leather teaches a method for calculating values for pixels of an image having its pixels arranged in rows and columns parallel to first and second perpendicular axes (column 7 and Fig. 9), respectively, comprising:

Calculating sample values for pixels of the image in accordance with one or more sample patterns (*at least two sampling patterns are shown in Fig. 9 wherein each sampling pattern has two enabled samples to be calculated, see column 7)*, the region of potential sampling locations relative to a pixel considered as divided evenly into a four-by-four array of sub-regions (*See Leather Fig. 9, wherein the sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four arrays of sub-regions---each region having a 3*3 sub-pixels, and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions),* each sampling pattern having less than three sample locations relative to a pixel *(In Leather Fig. 9, although three sample positions are indicated, each sampling pattern defines two enabled sample locations for the calculation of the sample values for pixels of the image. Leather's enabled sample locations meet the claim limitation of sample locations. See Leather column 7, lines 19-25 wherein the use of a coverage mask to enable/disable samples corresponding to such locations allowing less than three sample values to be calculated---see column 7, lines 60-65 wherein two samples are taken from a pixel immediately below the current pixel. A weighted average is then computed based on the enabled samples to determine the final color for the pixel)*, each sample location located at one of four candidate sampling locations

(*See Leather Fig. 9, wherein the sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four arrays of sub-regions---each region having a 3*3 sub-pixels. This four-by-four arrays of sub-regions include at least four arbitrary candidate sampling locations. Each enabled sample location located at one of four candidate sampling locations because the sampling pattern of Fig. 9 includes at least four candidate sampling locations*), and the candidate sampling locations arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions (*See Leather Fig. 9, wherein the sampling patterns are considered as dividing the regions of respective pixels into the same four-by-four arrays of sub-regions---each region having a 3*3 sub-pixels, and four potential sample positions are arranged within the array in a manner whereby no two potential sample positions are located in the same row, column, or diagonal of sub-regions , the plurality of sampling patterns comprising first and second sampling patterns with the second sampling pattern rotated 90 degree, each defining two enabled sampling positions from the three sampling positions or the four potential sampling positions in the array because there exists at least four potential sampling positions that can be generated; see also column 7. The two candidate sampling locations are not located along the same row, column or diagonal of sub-regions*); and

Calculating values for pixels of the image from sample values calculated from respective pixels (*see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*); and

Applying the values for the pixels as graphics data for the image (See Leather column 6).

Claim 43:

The claim 43 encompasses the same scope of invention as that of claim 42 except additional claimed limitation of the two sample locations located in the first and fourth rows of the array of sub-regions.

However, Leather further discloses the claimed limitation of the two sample locations located in the first and fourth rows of the array of sub-regions (*see Figs. 9-10*).

Claim 44:

The claim 44 encompasses the same scope of invention as that of claim 43 except additional claimed limitation of the two sample locations located substantially at the center of respective sub-regions. However, Leather further discloses the claimed limitation of the two sample locations located substantially at the center of respective sub-regions (*e.g., Figs. 9-10*).

Claim 45:

The claim 45 encompasses the same scope of invention as that of claim 43 except additional claimed limitation of the two sample locations located at the center of respective sub-regions. However, Leather further discloses the claimed limitation of the two sample locations located at the center of respective sub-regions (*e.g., Leather Figs. 9-10*).

Claim 46:

The claim 46 encompasses the same scope of invention as that of claim 42 except additional claimed limitation of the two sample locations located in the second and third rows of the array of sub-regions. However, Leather further discloses the claimed limitation of the two sample locations located in the second and third rows of the array of sub-regions (*see Figs. 9-10*).

Claim 47:

The claim 47 encompasses the same scope of invention as that of claim 446 except additional claimed limitation of the two sample locations located substantially at the center of respective sub-regions. However, Leather further discloses the claimed limitation of the two sample locations located substantially at the center of respective sub-regions (*e.g., Figs. 9-10*).

Claim 48:

The claim 48 encompasses the same scope of invention as that of claim 46 except additional claimed limitation of the two sample locations located at the center of respective sub-regions. However, Leather further discloses the claimed limitation of the two sample locations located at the center of respective sub-regions (*e.g., Leather Figs. 9-10*).

Claims 23 and 25-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Deering U.S. Pat. No. 6,664,955 (hereinafter Deering).

Claim 23:

Deering teaches a method for calculating values for pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating sample values for pixels of the image in accordance with a plurality of sampling rates, the sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate differing for at least two pixels of the image (*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein*

the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels) and alternating per pixel for consecutive pixels along lines parallel to one or the other axes of the image for at least some of the horizontal or vertical lines of pixels of the image (*Deering discloses in Fig. 5A alternating per pixel for consecutive pixels along the horizontal lines dividing the pixels wherein the horizontal lines are parallel to horizontal axis of the image; see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*);

Calculating values for pixels of the image from respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Storing the values for the pixels as graphics data for the image (Fig. 7).

Claim 25:

The claim 25 encompasses the same scope of invention as that of claim 23 except additional claimed limitation of the sampling rate being constant for the pixels arranged along any given line parallel to the first axis and varies among the plurality of sampling rates for the pixels arranged along any given line parallel to the second axis.

However, Deering further discloses the claimed limitation of the sampling rate being constant for the pixels arranged along any given line parallel to the first axis and varies among the plurality of sampling rates for the pixels arranged along any given line parallel to the second axis (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*).

Claim 26:

The claim 26 encompasses the same scope of invention as that of claim 25 except additional claimed limitation of the first and second sampling rates alternating per pixel for consecutive pixels in any line parallel to the second axis.

However, Deering further discloses the claimed limitation of the first and second sampling rates alternating per pixel for consecutive pixels in any line parallel to the second axis (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*).

Claim 27:

Deering teaches a method for calculating values for pixels of an image having the pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating sample values for pixels of the image in accordance with first and second sampling rates, the sampling rate defined by the number of samples per pixel and at least one sample per pixel, the sampling rate remaining constant for consecutive pixels arranged along any one given line parallel to the first axis and varying between the first and second sampling rates for consecutive pixels arranged along any one given line parallel to the second axis (*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels; the sampling rate remaining constant for consecutive pixels arranged along any given vertical line parallel to the vertical axis and*

varying between the first and second sampling rates for consecutive pixels arranged along any given horizontal line parallel to the horizontal axis);

Calculating values for pixels of the image from a respective calculated sample values (*see Deering Fig. 5A and 23; column 14, lines 64-67; column 15, lines 1-10*); and

Providing the calculated values as graphics data for the image (Deering Fig. 7).

Claim 28:

The claim 28 encompasses the same scope of invention as that of claim 27 except additional claimed limitation of the pixels of the image being arranged in rows parallel to the first axis and columns parallel to the second axis, and the first and second sampling rates alternating every row of pixels. However, Deering further discloses the claimed limitation of the pixels of the image being arranged in rows parallel to the first axis and columns parallel to the second axis, and the first and second sampling rates alternating every row of pixels (*Deering discloses in Fig. 5A the variable sampling rates for pixels along the horizontal direction wherein the sampling rate differing for at least two pixels of the image. See also Fig. 23 wherein the first sampling pattern corresponds to the pattern for the interpolated pixels and the second sampling pattern corresponds to the pattern for the filtered pixels*).

Re Claim 29:

Deering further discloses in Fig. 5A and Fig. 23 that the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel.

Re Claim 30:

Deering further discloses in Fig. 5A and Fig. 23 the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel, the two sample locations per pixel for the first sampling rate arranged within a pixel along a line forming an acute angle with respect to either the first or second axes.

Re Claim 31:

Deering further discloses in Fig. 5A and Fig. 23 that the first sampling rate is two samples per pixel and the second sampling rate is one sample per pixel, the two samples per pixel for the first sampling rate arranged within a pixel substantially along and on opposite sides of a line parallel to either the first or second axes that divides the pixel in two, the axis to which the line is parallel alternating per consecutive pixel arranged along a line parallel to the first axis.

Re Claim 32:

Deering further discloses in Fig. 5A that the two samples per pixel of the first sampling rate vary for every other consecutive pixel lying along a line parallel to the first axis between a given sampling pattern and another sampling pattern which is substantially the same pattern rotated 90 degrees.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 42-48 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato et al. U.S. Pat. No. 6,731,301 (hereinafter Sato).

Claim 42:

Sato teaches a method for calculating values for pixels of an image having its pixels arranged in rows and columns parallel to first and second perpendicular axes, respectively, comprising:

Calculating sample values for pixels of the image in accordance with one or more sample patterns (*e.g., the sample patterns are different because the sampling locations are different from pixels in the same row. The sampling patterns are different because the sampling rates are different from pixels in the same column. Fig. 31 of Sato discloses one sample pattern, Fig. 32 discloses another sample pattern and Fig. 35 discloses two sample patterns*), the region of potential sampling locations relative to a pixel considered as divided evenly into a four-by-four array of sub-regions each sampling pattern having less than three sample locations relative to a pixel (*e.g., at column 12, lines 49-53 and column 13, lines 25-35, Sato teaches 4 × 4 stamp by super sampling P × P subpixels per one stamp of 4×4 subpixels with $P = 2^n$. For n = 0, the 1 ×1 super sampling only samples one subpixel per stamp of 4 × 4 subpixels. At column 13, lines 25-53 and column 14, lines 28-35, Sato teaches P × P sparse sampling while the stamp is composed of M × N subpixels and thus disclosing 1 × 1 sparse sampling in a stamp of 4 × 4 subpixels. Sato further discloses selecting several points from the samples and thus disclosing selecting less than three sample locations relative to a pixel. See column 15, lines 30-37 wherein the number of subpixels in the stamp exceeds the number of sampling subpixels for the case N > P. Thus, the*

claim limitation of calculating less than three sample values for a pixel is taught by Sato in any of these contexts), each sample location located at one of four candidate sampling locations, and the candidate sampling locations arranged in a manner whereby no two of the four candidate sample locations for a given sampling pattern are located along the same row, column, or diagonal of sub-regions, at least one sampling pattern including at least one other sampling location not located in one of the candidate sampling locations, no more than seven sub-regions containing any sampling location (see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14);

Calculating values for pixels of the image from sample values calculated from respective pixels (*see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*); and

Applying the values for the pixels as graphics data for the image (see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14).

Sato implicitly teaches the claim limitation, "the sampling pattern having less than three sample locations relative to a pixel" within "calculating sample values for pixels of the image in accordance with a sampling pattern, the region of potential sampling locations relative to a pixel considered as divided evenly into a four-by-four array of sub-regions, the sampling pattern having less than three sample locations relative to a pixel, each sample location located at one of four candidate sampling locations."

Sato teaches calculating four sample values for pixels of an image in accordance with a sampling pattern for each pixel comprising calculating one sample value, two sample values in a loop of actions. Moreover, Sato teaches that four samples are available for calculation. This does not mean all four samples have to be always calculated. Sato may only have to calculate less than four sample values. Therefore, Sato implicitly teaches the claim limitation of "calculating less

than three sample values for pixels of an image in accordance with a sampling pattern for each pixel. Sato has four samples for each pixel and Sato's calculation comprises calculating the first sample for each pixel, followed by calculating the second sample for each pixel and stop there without calculating the remaining sample values, or calculating the remaining samples at a later time.

Moreover, samples are calculated on a one-by-one basis either consecutively or pair-wise simultaneously, in whatever manner. Sato does not have to calculate all four samples even though all four samples are available for a pixel. Applicant's claim limitation does not recite "calculating only two sample values for each pixel wherein each pixel only has two samples". The claim limitation of "calculating less than three sample values for pixels of an image in accordance with a sampling pattern for each pixel" set forth in the claim 1 is subject to the broadest interpretation consistent with applicant's specification.

During patent examination, the claims are given the broadest reasonable interpretation consistent with the specification. See In re Morris, 127 F.3d 1048, 44 USPQ2d 1023 (Fed. Cir. 1997). See MPEP § 2111 - § 2116.01, for case law pertinent to claim analysis. Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322

(Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

Therefore, in view of Sato, having four samples available, Sato can choose any of the samples for the calculation of a value for the pixel, including calculating less than three samples for a pixel. Thus, the claim limitation of calculating less than three sample values for a pixel is taught by Sato.

Moreover, at column 12, lines 49-53 and column 13, lines 25-35, Sato teaches 4 × 4 stamp by super sampling P × P subpixels per one stamp of 4×4 subpixels with $P = 2^n$. For n = 0, the 1 ×1 super sampling only samples one subpixel per stamp of 4 × 4 subpixels. At column 13, lines 25-53 and column 14, lines 28-35, Sato teaches P × P sparse sampling while the stamp is composed of M × N subpixels and thus disclosing 1 × 1 sparse sampling in a stamp of 4 × 4 subpixels. Sato further discloses selecting several points from the samples and thus disclosing selecting and calculating less than three sample locations relative to a pixel. See

column 15, lines 30-37, wherein the number of subpixels in the stamp exceeds the number of sampling subpixels for the case N > P. Thus, the claim limitation of calculating less than three sample values for a pixel is taught in many different contexts by Sato.

Claim 43:

The claim 43 encompasses the same scope of invention as that of claim 42 except additional claimed limitation of the two sample locations located in the first and fourth rows of the array of sub-regions.

However, Sato further discloses the claimed limitation of the two sample locations located in the first and fourth rows of the array of sub-regions (*see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*).

Claim 44:

The claim 44 encompasses the same scope of invention as that of claim 43 except additional claimed limitation of the two sample locations located substantially at the center of respective sub-regions. However, Sato further discloses the claimed limitation of the two sample locations located substantially at the center of respective sub-regions (*e.g., each sub-pixel sample area forms a sub-region and therefore each sampling location lies at the center of a sub-region; see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*).

Claim 45:

The claim 45 encompasses the same scope of invention as that of claim 43 except additional claimed limitation of the two sample locations located at the center of respective sub-

regions. However, Sato further discloses the claimed limitation of the two sample locations located at the center of respective sub-regions (*e.g., each sub-pixel sample area forms a sub-region and therefore each sampling location lies at the center of a sub-region; see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*).

Claim 46:

The claim 46 encompasses the same scope of invention as that of claim 42 except additional claimed limitation of the two sample locations located in the second and third rows of the array of sub-regions. However, Sato further discloses the claimed limitation of the two sample locations located in the second and third rows of the array of sub-regions (*see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*).

Claim 47:

The claim 47 encompasses the same scope of invention as that of claim 446 except additional claimed limitation of the two sample locations located substantially at the center of respective sub-regions. However, Sato further discloses the claimed limitation of the two sample locations located substantially at the center of respective sub-regions (*e.g., each sub-pixel sample area forms a sub-region and therefore each sampling location lies at the center of a sub-region; see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14*).

Claim 48:

The claim 48 encompasses the same scope of invention as that of claim 46 except additional claimed limitation of the two sample locations located at the center of respective sub-regions. However, Sato further discloses the claimed limitation of the two sample locations located at the center of respective sub-regions (*e.g., each sub-pixel sample area forms a sub-*

region and therefore each sampling location lies at the center of a sub-region; see Figs. 26, 29, 34, 36, and 38; col. 2, 4, 8, 11-12; 13-14).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (571) 272-7665. The examiner can normally be reached on 8:00 - 6:30 (Mon-Thu).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kee Tung can be reached on (571) 272-7794. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Jin-Cheng Wang/
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